What is claimed is:

1. An adaptive programmable light imaging device, comprising:

an array of active pixel sensor pixels, each pixel producing a signal based only on the received radiation within the pixel;

a plurality of programmable summation kernels, each summation kernel programmable to selectively sum together a number of said pixels from said active pixel sensor; and

a resolution control circuit, producing an output signal which controls a size of said summation kernels between a minimum value kernel size and a maximum value kernel size.

2. A device as in claim 1, wherein said resolution control circuit monitors a magnitude of a received signal level, and changes the size of the summation kernels based on said signals from said pixels.

3. A device as in claim 2, wherein said resolution control circuit is based on illumination condition, and decreases the kernel size for better illumination condition and increases the kernel size for poorer illumination condition.

4. A device as in claim 3, wherein said minimum kernel size is one pixel.

5.   A device as in claim 3, wherein said illumination condition is judged by a magnitude of said signal from said active pixel sensors.

6.   A device as in claim 3, wherein said resolution control circuit includes a digital circuit.

7.   A device as in claim 6, wherein said digital circuit includes a plurality of comparators, each having a different threshold, and wherein said signal from said active pixel sensors is input in parallel to each of said comparators.

8.   A device as in claim 7, wherein outputs of said comparators are connected to output respective signals.

9.   A device as in claim 3, further comprising a counter which counts a number of pixels which are in specified illumination states and sets said summation kernel size based on said count.

10. A device as in claim 9, wherein said counter detects whether at least half of the image has sufficiently bright pixels, and if so, configures the kernel size to be one.

11. A device as in claim 9, wherein said counter determines if at least half of the number of pixels are dimmer than a specified value, and if so sets the kernel size to a preset maximum value.

12. A device as in claim 1, further comprising a frame memory, for storing an entire frame as a stored frame, and

wherein said resolution control circuit is based on illumination condition in said stored frame, and decreases the kernel size in a subsequent frame for better illumination condition and increases the kernel size in said subsequent frame for poorer illumination condition.

13. A device as in claim 3, wherein said active pixel sensor includes a photoreceptor and a buffer transistor and a selection transistor.

14. A device as in claim 13, further comprising self-calibrating the circuit prior to detecting an illumination condition.

15. A device as in claim 1, wherein said active pixel sensor includes a photoreceptor and a buffer transistor and a selection transistor, further comprising calibrating the circuit the circuit prior to detecting a desired resolution.

16. An adaptive programmable light imaging device, comprising:

an array of active pixel sensor pixels, each pixel having an in-pixel buffer transistor, and in-pixel selection transistor, and a photoreceptor producing a signal based only on the received radiation within the pixel;

a double sampling circuit, operating to eliminate at least one amplifier offset from said signal;

a plurality of programmable summation kernels, each summation kernel programmable to selectively sum together a number of said pixels from said active pixel sensor; and

a resolution control circuit, including an illumination condition detecting part connected to said active pixel sensor pixels and determining the illumination condition therefrom, and producing an output signal which controls a size of said summation kernels between a minimum value kernel size for a maximum illumination condition, and a maximum value kernel size based on a minimum illumination condition.

17. A device as in claim 16, wherein said illumination condition detecting part comprises a counter which counts numbers of pixels which are in specified illumination states and sets said summation kernel size based on said count.

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18. A device as in claim 17, wherein said counter detects whether at least half of the image has sufficiently bright pixels, and if so, configures the kernel size to be one.

19. A device as in claim 17, wherein said counter determines if at least half of the number of pixels are dimmer than a specified value, and if so sets the kernel size to a preset maximum value.

20. A device as in claim 16, further comprising a frame memory, for storing an entire frame as a stored frame, and
wherein said resolution control circuit is based on illumination condition in said stored frame, and decreases the kernel size in a subsequent frame for better illumination condition and increases the kernel size in said subsequent frame for poorer illumination condition.